PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of

Roland H. PRATT

Group Art Unit: 2828

Application No.: 10/048,053

Examiner: Hung Vy

Filed: January 25, 2002

Docket No.: 111805

For: GAS LASER AND OPTICAL SYSTEM

REQUEST FOR RECONSIDERATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In reply to the May 10, 2004 Office Action, reconsideration of the application is respectfully requested in light of the following remarks. Claims 1 and 3-13 are pending.

The Office Action rejects claims 1 and 3-13 under 35 U.S.C. §103(a) over Eberhardt (U.S. Patent No. 4,535,241) in view of Sanders et al. (U.S. Patent No. 4,475,199). The rejection is respectfully traversed.

In particular, none of the applied references disclose, suggest or render obvious an optical apparatus that includes at least one optical feedback element which receives light output from a laser and returns at least 0.1% of the light output of the laser towards the laser, as recited in independent claim 1, and similarly recited in independent claims 3 and 10-13.

Eberhardt teaches a method and apparatus for quantitatively determining the concentration of gaseous hydrogen fluoride in a medium containing gaseous hydrogen fluoride (Abstract).

Furthermore, Eberhardt teaches a dual frequency laser, the outputs of which are compared and used to detect hydrogen sulfide gas. For example, Eberhardt teaches that the transition frequency of Ne 3 p_2-2 s_2 is not absorbed by hydrogen sulfide gas, and the laser output is compared with another output frequency which is partially absorbed by the gas (Col. 9, lines 26-29). Accordingly, the difference in the strengths of the two frequencies gives a measure of the amount of the gas present, and the specific laser cavities and gases used in Eberhardt are chosen for this specific purpose. As such, a laser having an output of a frequency which is absorbed by hydrogen fluoride gas and an output which is not absorbed by the gas is essential to the working of the invention of Eberhardt. Eberhardt does not teach or suggest that any other type of laser other than the types of lasers disclosed would produce the desired frequencies.

Moreover, Eberhardt would not use a helium neon (H_eN_e) laser having Ne^{20} and Ne^{22} isotopes in substantially equal proportions because the frequencies generated by a laser with the gas mixture recited in claim 1 would not be absorbed by hydrogen fluoride gas. As such, there would have been no motivation to combine Eberhardt with another type of laser.

Sanders teaches a Zeeman ring laser gyro that includes a laser medium of helium neon consisting of dual isotopes of Ne^{20} and Ne^{22} in which 53.5% is Ne^{20} and 46.5% is Ne^{22} by volume (Abstract).

Accordingly, any combination of the laser taught in Eberhardt with the laser taught in Saunders would render Eberhardt inoperable for its intended purpose because Sanders does not teach or suggest that the laser would be absorbed by gaseous hydrogen fluoride.

The laser taught in Sanders is not a linear type laser, but is a ring laser (Abstract), and therefore is not suitable for use with Eberhardt because Eberhardt needs a projected laser beam in order to properly operate.

The Office Action also alleges that Eberhardt discloses a laser having Ne^{20} and Ne^{22} isotopes (Office Action, page 3, lines 7-8). However, Eberhardt instead two laser discharge tubes that can be filled with Ne^{20} or with Ne^{22} (Col. 6, lines 1-10). However, Eberhardt does not teach a mixture of both Ne^{20} and Ne^{22} isotopes, and does not teach a mixture of both types of isotopes in substantially the same percentage.

Finally, none of the applied references disclose or suggest an optical feedback in excess of 0.1%, as recited in claims 1 and 10-13. Instead, in Eberhardt, optical feedback must be reduced as much as possible because the frequency of the laser output is relied upon for accuracy. For example, the acoustic cell 22 (Fig. 4) in Eberhardt is designed to reduce feedback. Moreover, there is no apparatus to receive laser feedback. The mirrors 5 and 5A in Eberhardt (Fig. 1) are part of the resonant cavity of the laser and do not receive light from the laser. Accordingly, contrary to the Office Action's allegation that 0.1% optical feedback is inherent in Eberhardt (Office Action, page 2, line 11), an 0.1% optical feedback is unacceptably high for a laser in Eberhardt. The feedback is reduced using, for example, the acoustic cell 22. The Office Action also designates elements 15, 12 and 18 of Eberhardt as being optical feedback elements (Office Action, page 2, line 10). However, these elements are light detectors 15 and 12 and electronics 18 which do not function as optical feedback elements because they do not reflect light back into the laser.

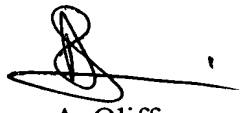
Accordingly, any combination of Eberhardt and Sanders would not result in an optical apparatus wherein at least one optical feedback element receives light output from the laser and returns at least 0.1% of the light output of the laser towards the laser.

Thus, because it would not have been obvious to combine Eberhardt and Sanders to arrive at the claimed invention, independent claims 1, 3 and 10-13, and their dependent claims, are patentable over a combination of Eberhardt and Sanders. As such, withdrawal of the rejection of the claims under 35 U.S.C. §103(a) is respectfully requested.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 3-13 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Date: August 10, 2004

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